SEQUENCE LISTING

<110> Reed, John C.

<120> Novel Card Proteins Involved in Cell Death Regulation

<130> P-LJ 3650

<140> 09/388,221
<141> 1999-09-01

<160> 18

<170> PatentIn Ver. 2.1

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aag aag gag gag ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg   96
Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                20   25   30

cac tcc agg agc tct tcg ggt gag aca ccc gct cag cca gag aag acg   144
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
            35   40   45

agt ggc atg gag gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag   192
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
        50   55   60

cgg gcc tgg gac cta gcc ctc cat acc tgg gag cag atg ggg ctg agg   240
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65   70   75   80

tca ctg tgc gcc caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc   288
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                    85   90   95

1

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ccc tac agc cca agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc    336
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
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tcc acc gca gtg cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc    384
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
        115                 120                 125

acc cag ggc tca gag aga agg gtt ttg aga cag ctg cct gac aca tct    432
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
        130                 135                 140

gga cgc cgc tgg aga gaa atc tct gcc tca ctc ctc tac caa gct ctt    480
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145                 150                 155                 160

cca agc tcc cca gac cat gag tct cca agc cag gag tca ccc aac gcc    528
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165                 170                 175

ccc aca tcc aca gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc    576
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
        180                 185                 190

agc cta gca ccc aga gag cag gag gct cct ggg acc caa tgg cct ctg    624
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
        195                 200                 205

gat gaa acg tca gga att tac tac aca gaa atc aga gaa aga gag aga    672
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
        210                 215                 220

gag aaa tca gag aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg    720
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225                 230                 235                 240

ccc cca cag gcg cac acc agc cta cag ccc cac cac cac cca tgg gag    768
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245                 250                 255

cct tct gtg aga gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag    816
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260                 265                 270

gat ttt aac caa aaa ttc aca cag ctg cta ctt cta caa aga cct cac    864
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
        275                 280                 285
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2

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ccc aga agc caa gat ccc ctg gtc aag aga agc tgg cct gat tat gtg      912
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
        290             295             300

gag gag aat cga gga cat tta att gag atc aga gac tta ttt ggc cca      960
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305             310             315             320

ggc ctg gat acc caa gaa cct cgc ata gtc ata ctg cag ggg gct gct     1008
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325             330             335

gga att ggg aag tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg     1056
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
            340             345             350

aga ggc cag ctg tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc     1104
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
            355             360             365

tgc aga gag ctg gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc     1152
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
        370             375             380

gga aaa gat ggg aca gcc act ccg gct ccc att aga cag atc ctg tct     1200
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385             390             395             400

agg cca gag cgg ctg ctc ttc atc ctc gat ggt gta gat gag cca gga     1248
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
            405             410             415         .

tgg gtc ttg cag gag ccg agt tct gag ctc tgt ctg cac tgg agc cag     1296
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
            420             425             430

cca cag ccg gcg gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata     1344
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
            435             440             445

ctt ccc gag gca tcc ttc ctg atc acg gct cgg acc aca gct ctg cag     1392
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
            450             455             460

aac ctc att cct tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg     1440
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465             470             475             480
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3

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ttc tct gag tcc agc agg aag gaa tat ttc tac aga tat ttc aca gat        1488
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485             490             495

gaa agg caa gca att aga gcc ttt agg ttg gtc aaa tca aac aaa gag        1536
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
            500             505             510

ctc tgg gcc ctg tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act        1584
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
            515             520             525

tgc ctg atg cag cag atg aag cgg aag gaa aaa ctc aca ctg act tcc        1632
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
            530             535             540

aag acc acc aca acc ctc tgt cta cat tac ctt gcc cag gct ctc caa        1680
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545             550             555             560

gct cag cca ttg gga ccc cag ctc aga gac ctc tgc tct ctg gct gct        1728
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
            565             570             575

gag ggc atc tgg caa aaa aag acc ctt ttc agt cca gat gac ctc agg        1776
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
            580             585             590

aag cat ggg tta gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt        1824
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
            595             600             605

att ctt caa gag cac ccc atc cct ctg agc tac agc ttc att cac ctc        1872
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
            610             615             620

tgt ttc caa gag ttc ttt gca gca atg tcc tat gtc ttg gag gat gag        1920
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625             630             635             640

aag ggg aga ggt aaa cat tct aat tgc atc ata gat ttg gaa aag acg        1968
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
            645             650             655

cta gaa gca tat gga ata cat ggc ctg ttt ggg gca tca acc aca cgt        2016
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660             665             670
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4

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ttc cta ttg ggc ctg tta agt gat gag ggg gag aga gag atg gag aac    2064
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675                 680                 685

atc ttt cac tgc cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc    2112
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690                 695                 700

ccg tcc ctg cag ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac    2160
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                 710                 715                 720

tgc ttg tac gag act cgg aac aaa acg ttc ctg aca caa gtg atg gcc    2208
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725                 730                 735

cat ttc gaa gaa atg ggc atg tgt gta gaa aca gac atg gag ctc tta    2256
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740                 745                 750

gtg tgc act ttc tgc att aaa ttc agc cgc cac gtg aag aag ctt cag    2304
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
                755                 760                 765

ctg att gag ggc agg cag cac aga tca aca tgg agc ccc acc atg gta    2352
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770                 775                 780

gtc ctg ttc agg tgg gtc cca gtc aca gat gcc tat tgg cag att ctc    2400
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                 790                 795                 800

ttc tcc gtc ctc aag gtc acc aga aac ctg aag gag ctg gac cta agt    2448
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805                 810                 815

gga aac tcg ctg agc cac tct gca gtg aag agt ctt tgt aag acc ctg    2496
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820                 825                 830

aga cgc cct cgc tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc    2544
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
                835                 840                 845

ctc aca gct gag gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac    2592
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
        850                 855                 860
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5

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cag acc ctg acc gag ctg gac ctg agc ttc aat gtg ctc acg gat gct      2640
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865             870             875             880

gga gcc aaa cac ctt tgc cag aga ctg aga cag ccg agc tgc aag cta      2688
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                885             890             895

cag cga ctg cag ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag      2736
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900             905             910

gac ctg gcc tct gtg ctt agt gcc agc ccc agc ctg aag gag cta gac      2784
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915             920             925

ctg cag cag aac aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag      2832
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
        930             935             940

ggg ctc agg cat cct gcc tgc aaa ctc ata cgc ctg ggg ctg gac cag      2880
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln
945             950             955             960

aca act ctg agt gat gag atg agg cag gaa ctg agg gcc ctg gag cag      2928
Thr Thr Leu Ser Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln
            965             970             975

gag aaa cct cag ctg ctc atc ttc agc aga cgg aaa cca agt gtg atg      2976
Glu Lys Pro Gln Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met
            980             985             990

acc cct act gag ggc ctg gat acg gga gag atg agt aat agc aca tcc      3024
Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser
            995             1000            1005

tca ctc aag cgg cag aga ctc gga tca gag agg gcg gct tcc cat gtt      3072
Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val
    1010            1015            1020

gct cag gct aat ctc aaa ctc ctg gac gtg agc aag atc ttc cca att      3120
Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile
1025            1030            1035            1040

gct gag att gca gag gaa agc tcc cca gag gta gta ccg gtg gaa ctc      3168
Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu
            1045            1050            1055
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6

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ttg tgc gtg cct tct cct gcc tct caa ggg gac ctg cat acg aag cct        3216
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        1060                1065                1070


ttg ggg act gac gat gac ttc tgg ggc ccc acg ggg cct gtg gct act        3264
Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val Ala Thr
        1075                1080                1085


gag gta gtt gac aaa gaa aag aac ttg tac cga gtt cac ttc cct gta        3312
Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe Pro Val
     1090                1095                1100


gct ggc tcc tac cgc tgg ccc aac acg ggt ctc tgc ttt gtg atg aga        3360
Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val Met Arg
1105                1110                1115                1120


gaa gcg gtg acc gtt gag att gaa ttc tgt gtg tgg gac cag ttc ctg        3408
Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln Phe Leu
        1125                1130                1135


ggt gag atc aac cca cag cac agc tgg atg gtg gca ggg cct ctg ctg        3456
Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro Leu Leu
        1140                1145                1150


gac atc aag gct gag cct gga gct gtg gaa gct gtg cac ctc cct cac        3504
Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu Pro His
        1155                1160                1165


ttt gtg gct ctc caa ggg ggc cat gtg gac aca tcc ctg ttc caa atg        3552
Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe Gln Met
     1170                1175                1180


gcc cac ttt aaa gag gag ggg atg ctc ctg gag aag cca gcc agg gtg        3600
Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala Arg Val
1185                1190                1195                1200


gag ctg cat cac ata gtt ctg gaa aac ccc agc ttc tcc ccc ttg gga        3648
Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro Leu Gly
        1205                1210                1215


gtc ctc ctg aaa atg atc cat aat gcc ctg cgc ttc att ccc gtc acc        3696
Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro Val Thr
        1220                1225                1230


tct gtg gtg ttg ctt tac cac cgc gtc cat cct gag gaa gtc acc ttc        3744
Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val Thr Phe
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7

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cac ctc tac ctg atc cca agt gac tgc tcc att cgg aag gcc ata gat      3792
His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Ala Ile Asp
    1250              1255              1260


gat cta gaa atg aaa ttc cag ttt gtg cga atc cac aag cca ccc ccg      3840
Asp Leu Glu Met Lys Phe Gln Phe Val Arg Ile His Lys Pro Pro Pro
1265              1270              1275              1280


ctg acc cca ctt tat atg ggc tgt cgt tac act gtg tct ggg tct ggt      3888
Leu Thr Pro Leu Tyr Met Gly Cys Arg Tyr Thr Val Ser Gly Ser Gly
              1285              1290              1295


tca ggg atg ctg gaa ata ctc ccc aag gaa ctg gag ctc tgc tat cga      3936
Ser Gly Met Leu Glu Ile Leu Pro Lys Glu Leu Glu Leu Cys Tyr Arg
              1300              1305              1310


agc cct gga gaa gac cag ctg ttc tcg gag ttc tac gtt ggc cac ttg      3984
Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr Val Gly His Leu
         1315              1320              1325


gga tca ggg atc agg ctg caa gtg aaa gac aag aaa gat gag act ctg      4032
Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys Asp Glu Thr Leu
         1330              1335              1340


gtg tgg gag gcc ttg gtg aaa cca gga gat ctc atg cct gca act act      4080
Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met Pro Ala Thr Thr
1345              1350              1355              1360


ctg atc cct cca gcc cgc ata gcc gta cct tca cct ctg gat gcc ccg      4128
Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro Leu Asp Ala Pro
              1365              1370              1375


cag ttg ctg cac ttt gtg gac cag tat cga gag cag ctg ata gcc cga      4176
Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln Leu Ile Ala Arg
              1380              1385              1390


gtg aca tcg gtg gag gtt gtc ttg gac aaa ctg cat gga cag gtg ctg      4224
Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His Gly Gln Val Leu
         1395              1400              1405


agc cag gag cag tac gag agg gtg ctg gct gag aac acg agg ccc agc      4272
Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn Thr Arg Pro Ser
    1410              1415              1420


cag atg cgg aag ctg ttc agc ttg agc cag tcc tgg gac cgg aag tgc      4320
Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp Asp Arg Lys Cys
1425              1430              1435              1440


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aaa gat gga ctc tac caa gcc ctg aag gag acc cat cct cac ctc att    4368
Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His Pro His Leu Ile
              1445                    1450                  1455


atg gaa ctc tgg gag aag ggc agc aaa aag gga ctc ctg cca ctc agc    4416
Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu Leu Pro Leu Ser
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agc tga                                                            4422
Ser
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<212> PRT
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            20                  25                  30
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
         35                  40                  45
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
       50                  55                  60
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65              70                  75                      80
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                85                  90                  95
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100                 105                 110
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
         115                 120                 125
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
         130             135                 140
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145             150                 155                 160
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
            165                 170                 175
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180                 185                 190
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
         195                 200                 205
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
         210                 215                 220
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
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9

Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                    245   250   255

Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                    260   265   270

Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
                    275   280   285

Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
                    290   295   300

Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305   310   315   320

Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                    325   330   335

Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
                    340   345   350

Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
                    355   360   365

Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
                    370   375   380

Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385   390   395   400

Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                    405   410   415

Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
                    420   425   430

Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
                    435   440   445

Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
                    450   455   460

Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465   470   475   480

Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                    485   490   495

Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
                    500   505   510

Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
                    515   520   525

Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
                    530   535   540

Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545   550   555   560

Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                    565   570   575

Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
                    580   585   590

Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
                    595   600   605

Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu

10

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           610                     615                     620
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625                     630                     635                     640
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                    645                     650                     655
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
                    660                     665                     670
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
                    675                     680                     685
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
                    690                     695                     700
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                     710                     715                     720
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                    725                     730                     735
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                    740                     745                     750
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
                    755                     760                     765
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
                    770                     775                     780
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                     790                     795                     800
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                    805                     810                     815
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                    820                     825                     830
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
                    835                     840                     845
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
                    850                     855                     860
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865                     870                     875                     880
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                    885                     890                     895
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
                    900                     905                     910
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
                    915                     920                     925
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
                    930                     935                     940
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln
945                     950                     955                     960
Thr Thr Leu Ser Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln
                    965                     970                     975
Glu Lys Pro Gln Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met
                    980                     985                     990
Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser
```

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          995                1000               1005
Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val
     1010                1015               1020
Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile
1025            1030               1035               1040
Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu
               1045               1050               1055
Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr Lys Pro
          1060               1065               1070
Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val Ala Thr
          1075               1080               1085
Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe Pro Val
     1090               1095               1100
Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val Met Arg
1105            1110               1115               1120
Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln Phe Leu
               1125               1130               1135
Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro Leu Leu
          1140               1145               1150
Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu Pro His
          1155               1160               1165
Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe Gln Met
     1170               1175               1180
Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala Arg Val
1185            1190               1195               1200
Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro Leu Gly
               1205               1210               1215
Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro Val Thr
          1220               1225               1230
Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val Thr Phe
          1235               1240               1245
His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Ala Ile Asp
     1250               1255               1260
Asp Leu Glu Met Lys Phe Gln Phe Val Arg Ile His Lys Pro Pro Pro
1265            1270               1275               1280
Leu Thr Pro Leu Tyr Met Gly Cys Arg Tyr Thr Val Ser Gly Ser Gly
               1285               1290               1295
Ser Gly Met Leu Glu Ile Leu Pro Lys Glu Leu Glu Leu Cys Tyr Arg
          1300               1305               1310
Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr Val Gly His Leu
          1315               1320               1325
Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys Asp Glu Thr Leu
     1330               1335               1340
Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met Pro Ala Thr Thr
1345            1350               1355               1360
Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro Leu Asp Ala Pro
               1365               1370               1375
Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln Leu Ile Ala Arg
```

12

```
                1380              1385                1390
Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His Gly Gln Val Leu
        1395              1400                1405
Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn Thr Arg Pro Ser
     1410              1415                1420
Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp Asp Arg Lys Cys
1425              1430                1435              1440
Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His Pro His Leu Ile
              1445              1450                1455
Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu Leu Pro Leu Ser
          1460              1465                1470
Ser
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<210> 3
<211> 4200
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(4197)

<400> 3
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atg gct ggc gga gcc tgg ggc cgc ctg gcc tgt tac ttg gag ttc ctg    48
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
 1               5                   10                  15

aag aag gag gag ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg    96
Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                20                  25                  30

cac tcc agg agc tct tcg ggt gag aca ccc gct cag cca gag aag acg   144
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
            35                  40                  45

agt ggc atg gag gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag   192
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
    50                  55                  60

cgg gcc tgg gac cta gcc ctc cat acc tgg gag cag atg ggg ctg agg   240
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
65                  70                  75                  80

tca ctg tgc gcc caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc   288
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                85                  90                  95
```

13

```
ccc tac agc cca agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc    336
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100             105             110

tcc acc gca gtg cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc    384
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
            115             120             125

acc cag ggc tca gag aga agg gtt ttg aga cag ctg cct gac aca tct    432
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
            130             135             140

gga cgc cgc tgg aga gaa atc tct gcc tca ctc ctc tac caa gct ctt    480
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145             150             155             160

cca agc tcc cca gac cat gag tct cca agc cag gag tca ccc aac gcc    528
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165             170             175

ccc aca tcc aca gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc    576
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180             185             190

agc cta gca ccc aga gag cag gag gct cct ggg acc caa tgg cct ctg    624
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
            195             200             205

gat gaa acg tca gga att tac tac aca gaa atc aga gaa aga gag aga    672
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
            210             215             220

gag aaa tca gag aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg    720
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225             230             235             240

ccc cca cag gcg cac acc agc cta cag ccc cac cac cac cca tgg gag    768
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245             250             255

cct tct gtg aga gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag    816
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260             265             270

gat ttt aac caa aaa ttc aca cag ctg cta ctt cta caa aga cct cac    864
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
                275             280             285
```

14

```
ccc aga agc caa gat ccc ctg gtc aag aga agc tgg cct gat tat gtg      912
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
        290                 295                 300

gag gag aat cga gga cat tta att gag atc aga gac tta ttt ggc cca      960
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305                 310                 315                 320

ggc ctg gat acc caa gaa cct cgc ata gtc ata ctg cag ggg gct gct     1008
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                    325                 330                 335

gga att ggg aag tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg     1056
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
                340                 345                 350

aga ggc cag ctg tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc     1104
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
            355                 360                 365

tgc aga gag ctg gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc     1152
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
        370                 375                 380

gga aaa gat ggg aca gcc act ccg gct ccc att aga cag atc ctg tct     1200
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385                 390                 395                 400

agg cca gag cgg ctg ctc ttc atc ctc gat ggt gta gat gag cca gga     1248
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405                 410                 415

tgg gtc ttg cag gag ccg agt tct gag ctc tgt ctg cac tgg agc cag     1296
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
                420                 425                 430

cca cag ccg gcg gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata     1344
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
                435                 440                 445

ctt ccc gag gca tcc ttc ctg atc acg gct cgg acc aca gct ctg cag     1392
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
            450                 455                 460

aac ctc att cct tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg     1440
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465                 470                 475                 480
```

15

```
ttc tct gag tcc agc agg aag gaa tat ttc tac aga tat ttc aca gat    1488
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485             490             495

gaa agg caa gca att aga gcc ttt agg ttg gtc aaa tca aac aaa gag    1536
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
            500             505             510

ctc tgg gcc ctg tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act    1584
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
        515             520             525

tgc ctg atg cag cag atg aag cgg aag gaa aaa ctc aca ctg act tcc    1632
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
    530             535             540

aag acc acc aca acc ctc tgt cta cat tac ctt gcc cag gct ctc caa    1680
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545             550             555             560

gct cag cca ttg gga ccc cag ctc aga gac ctc tgc tct ctg gct gct    1728
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
            565             570             575

gag ggc atc tgg caa aaa aag acc ctt ttc agt cca gat gac ctc agg    1776
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
            580             585             590

aag cat ggg tta gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt    1824
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
        595             600             605

att ctt caa gag cac ccc atc cct ctg agc tac agc ttc att cac ctc    1872
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
    610             615             620

tgt ttc caa gag ttc ttt gca gca atg tcc tat gtc ttg gag gat gag    1920
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625             630             635             640

aag ggg aga ggt aaa cat tct aat tgc atc ata gat ttg gaa aag acg    1968
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
            645             650             655

cta gaa gca tat gga ata cat ggc ctg ttt ggg gca tca acc aca cgt    2016
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660             665             670
```

16

```
ttc cta ttg ggc ctg tta agt gat gag ggg gag aga gag atg gag aac      2064
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675                 680                 685

atc ttt cac tgc cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc      2112
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690                 695                 700

ccg tcc ctg cag ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac      2160
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                 710                 715                 720

tgc ttg tac gag act cgg aac aaa acg ttc ctg aca caa gtg atg gcc      2208
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725                 730                 735

cat ttc gaa gaa atg ggc atg tgt gta gaa aca gac atg gag ctc tta      2256
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740                 745                 750

gtg tgc act ttc tgc att aaa ttc agc cgc cac gtg aag aag ctt cag      2304
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
                755                 760                 765

ctg att gag ggc agg cag cac aga tca aca tgg agc ccc acc atg gta      2352
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770                 775                 780

gtc ctg ttc agg tgg gtc cca gtc aca gat gcc tat tgg cag att ctc      2400
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                 790                 795                 800

ttc tcc gtc ctc aag gtc acc aga aac ctg aag gag ctg gac cta agt      2448
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805                 810                 815

gga aac tcg ctg agc cac tct gca gtg aag agt ctt tgt aag acc ctg      2496
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820                 825                 830

aga cgc cct cgc tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc      2544
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
        835                 840                 845

ctc aca gct gag gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac      2592
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
        850                 855                 860
```

17

```
cag acc ctg acc gag ctg gac ctg agc ttc aat gtg ctc acg gat gct    2640
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865             870             875             880

gga gcc aaa cac ctt tgc cag aga ctg aga cag ccg agc tgc aag cta    2688
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                885             890             895

cag cga ctg cag ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag    2736
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900             905             910

gac ctg gcc tct gtg ctt agt gcc agc ccc agc ctg aag gag cta gac    2784
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915             920             925

ctg cag cag aac aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag    2832
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
            930             935             940

ggg ctc agg cat cct gcc tgc aaa ctc ata cgc ctg ggg aaa cca agt    2880
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945             950             955             960

gtg atg acc cct act gag ggc ctg gat acg gga gag atg agt aat agc    2928
Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
                965             970             975

aca tcc tca ctc aag cgg cag aga ctc gga tca gag agg gcg gct tcc    2976
Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
            980             985             990

cat gtt gct cag gct aat ctc aaa ctc ctg gac gtg agc aag atc ttc    3024
His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
            995             1000            1005

cca att gct gag att gca gag gaa agc tcc cca gag gta gta ccg gtg    3072
Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010            1015            1020

gaa ctc ttg tgc gtg cct tct cct gcc tct caa ggg gac ctg cat acg    3120
Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025            1030            1035            1040

aag cct ttg ggg act gac gat gac ttc tgg ggc ccc acg ggg cct gtg    3168
Lys Pro Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val
            1045            1050            1055
```

18

```
gct act gag gta gtt gac aaa gaa aag aac ttg tac cga gtt cac ttc     3216
Ala Thr Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe
         1060                1065                1070


cct gta gct ggc tcc tac cgc tgg ccc aac acg ggt ctc tgc ttt gtg     3264
Pro Val Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val
         1075                1080                1085


atg aga gaa gcg gtg acc gtt gag att gaa ttc tgt gtg tgg gac cag     3312
Met Arg Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln
        1090                1095                1100


ttc ctg ggt gag atc aac cca cag cac agc tgg atg gtg gca ggg cct     3360
Phe Leu Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro
1105                1110                1115                1120


ctg ctg gac atc aag gct gag cct gga gct gtg gaa gct gtg cac ctc     3408
Leu Leu Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu
              1125                1130                1135


cct cac ttt gtg gct ctc caa ggg ggc cat gtg gac aca tcc ctg ttc     3456
Pro His Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe
              1140                1145                1150


caa atg gcc cac ttt aaa gag gag ggg atg ctc ctg gag aag cca gcc     3504
Gln Met Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala
         1155                1160                1165


agg gtg gag ctg cat cac ata gtt ctg gaa aac ccc agc ttc tcc ccc     3552
Arg Val Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro
         1170                1175                1180


ttg gga gtc ctc ctg aaa atg atc cat aat gcc ctg cgc ttc att ccc     3600
Leu Gly Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro
1185                1190                1195                1200


gtc acc tct gtg gtg ttg ctt tac cac cgc gtc cat cct gag gaa gtc     3648
Val Thr Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val
              1205                1210                1215


acc ttc cac ctc tac ctg atc cca agt gac tgc tcc att cgg aag gaa     3696
Thr Phe His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Glu
         1220                1225                1230


ctg gag ctc tgc tat cga agc cct gga gaa gac cag ctg ttc tcg gag     3744
Leu Glu Leu Cys Tyr Arg Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu
         1235                1240                1245
```

19

```
ttc tac gtt ggc cac ttg gga tca ggg atc agg ctg caa gtg aaa gac        3792
Phe Tyr Val Gly His Leu Gly Ser Gly Ile Arg Leu Gln Val Lys Asp
   1250                1255                1260

aag aaa gat gag act ctg gtg tgg gag gcc ttg gtg aaa cca gga gat        3840
Lys Lys Asp Glu Thr Leu Val Trp Glu Ala Leu Val Lys Pro Gly Asp
1265                1270                1275                1280

ctc atg cct gca act act ctg atc cct cca gcc cgc ata gcc gta cct        3888
Leu Met Pro Ala Thr Thr Leu Ile Pro Pro Ala Arg Ile Ala Val Pro
                1285                1290                1295

tca cct ctg gat gcc ccg cag ttg ctg cac ttt gtg gac cag tat cga        3936
Ser Pro Leu Asp Ala Pro Gln Leu Leu His Phe Val Asp Gln Tyr Arg
                1300                1305                1310

gag cag ctg ata gcc cga gtg aca tcg gtg gag gtt gtc ttg gac aaa        3984
Glu Gln Leu Ile Ala Arg Val Thr Ser Val Glu Val Val Leu Asp Lys
        1315                1320                1325

ctg cat gga cag gtg ctg agc cag gag cag tac gag agg gtg ctg gct        4032
Leu His Gly Gln Val Leu Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala
   1330                1335                1340

gag aac acg agg ccc agc cag atg cgg aag ctg ttc agc ttg agc cag        4080
Glu Asn Thr Arg Pro Ser Gln Met Arg Lys Leu Phe Ser Leu Ser Gln
1345                1350                1355                1360

tcc tgg gac cgg aag tgc aaa gat gga ctc tac caa gcc ctg aag gag        4128
Ser Trp Asp Arg Lys Cys Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu
                1365                1370                1375

acc cat cct cac ctc att atg gaa ctc tgg gag aag ggc agc aaa aag        4176
Thr His Pro His Leu Ile Met Glu Leu Trp Glu Lys Gly Ser Lys Lys
                1380                1385                1390

gga ctc ctg cca ctc agc agc tga                                        4200
Gly Leu Leu Pro Leu Ser Ser
        1395
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<210> 4
<211> 1399
<212> PRT
<213> Homo sapiens

<400> 4

20

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Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
 1               5                  10                  15

Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
            20                  25                  30

His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
            35                  40                  45

Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
    50                  55                  60

Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
65                  70                  75                  80

Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                85                  90                  95

Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100                 105                 110

Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
            115                 120                 125

Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
    130                 135                 140

Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145                 150                 155                 160

Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
            165                 170                 175

Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180                 185                 190

Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
            195                 200                 205

Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
    210                 215                 220

Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225                 230                 235                 240

Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
            245                 250                 255
```

21

Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
       260   265   270

Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
       275   280   285

Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
     290   295   300

Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305   310   315   320

Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
          325   330   335

Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
          340   345   350

Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
          355   360   365

Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
       370   375   380

Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385   390   395   400

Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
          405   410   415

Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
          420   425   430

Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
          435   440   445

Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
        450   455   460

Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465   470   475   480

Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
          485   490   495

Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
          500   505   510

```
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
    515                 520                 525

Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
    530                 535                 540

Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545                 550                 555                 560

Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                565                 570                 575

Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
                580                 585                 590

Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
                595                 600                 605

Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
    610                 615                 620

Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625                 630                 635                 640

Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                645                 650                 655

Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
                660                 665                 670

Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
    675                 680                 685

Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
    690                 695                 700

Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                 710                 715                 720

Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725                 730                 735

His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740                 745                 750

Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
    755                 760                 765
```

```
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
    770                 775             780

Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                 790             795                 800

Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805             810             815

Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820             825             830

Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
            835             840             845

Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
    850             855             860

Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865             870             875                 880

Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                885             890             895

Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900             905             910

Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915             920             925

Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
    930             935             940

Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945             950             955                 960

Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
            965             970             975

Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
            980             985             990

His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
    995             1000            1005

Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010            1015            1020
```

24

```
Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025            1030            1035            1040

Lys Pro Leu Gly Thr Asp Asp Phe Trp Gly Pro Thr Gly Pro Val
         1045            1050            1055

Ala Thr Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe
      1060            1065            1070

Pro Val Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val
      1075            1080            1085

Met Arg Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln
      1090            1095            1100

Phe Leu Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro
1105            1110            1115            1120

Leu Leu Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu
         1125            1130            1135

Pro His Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe
      1140            1145            1150

Gln Met Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala
      1155            1160            1165

Arg Val Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro
   1170            1175            1180

Leu Gly Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro
1185            1190            1195            1200

Val Thr Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val
         1205            1210            1215

Thr Phe His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Glu
      1220            1225            1230

Leu Glu Leu Cys Tyr Arg Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu
      1235            1240            1245

Phe Tyr Val Gly His Leu Gly Ser Gly Ile Arg Leu Gln Val Lys Asp
   1250            1255            1260

Lys Lys Asp Glu Thr Leu Val Trp Glu Ala Leu Val Lys Pro Gly Asp
1265            1270            1275            1280
```

25

```
Leu Met Pro Ala Thr Thr Leu Ile Pro Pro Ala Arg Ile Ala Val Pro
             1285                  1290                  1295


Ser Pro Leu Asp Ala Pro Gln Leu Leu His Phe Val Asp Gln Tyr Arg
                 1300                  1305                  1310


Glu Gln Leu Ile Ala Arg Val Thr Ser Val Glu Val Val Leu Asp Lys
             1315                  1320                  1325


Leu His Gly Gln Val Leu Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala
         1330                  1335                  1340


Glu Asn Thr Arg Pro Ser Gln Met Arg Lys Leu Phe Ser Leu Ser Gln
 1345                  1350                  1355                  1360


Ser Trp Asp Arg Lys Cys Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu
                 1365                  1370                  1375


Thr His Pro His Leu Ile Met Glu Leu Trp Glu Lys Gly Ser Lys Lys
             1380                  1385                  1390


Gly Leu Leu Pro Leu Ser Ser
         1395




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atg gct ggc gga gcc tgg ggc cgc ctg gcc tgt tac ttg gag ttc ctg      48
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
  1               5                  10                  15


aag aag gag gag ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg      96
Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                 20                  25                  30


cac tcc agg agc tct tcg ggt gag aca ccc gct cag cca gag aag acg     144
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
             35                  40                  45
```

```
agt ggc atg gag gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag    192
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
     50                55                60


cgg gcc tgg gac cta gcc ctc cat acc tgg gag cag atg ggg ctg agg    240
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65                70                75                80


tca ctg tgc gcc caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc    288
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                 85                90                95


ccc tac agc cca agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc    336
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
             100               105               110


tcc acc gca gtg cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc    384
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
             115               120               125


acc cag ggc tca gag aga agg gtt ttg aga cag ctg cct gac aca tct    432
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
     130               135               140


gga cgc cgc tgg aga gaa atc tct gcc tca ctc ctc tac caa gct ctt    480
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145               150               155               160


cca agc tcc cca gac cat gag tct cca agc cag gag tca ccc aac gcc    528
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                 165               170               175


ccc aca tcc aca gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc    576
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
             180               185               190


agc cta gca ccc aga gag cag gag gct cct ggg acc caa tgg cct ctg    624
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
             195               200               205


gat gaa acg tca gga att tac tac aca gaa atc aga gaa aga gag aga    672
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
     210               215               220


gag aaa tca gag aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg    720
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225               230               235               240
```

```
ccc cca cag gcg cac acc agc cta cag ccc cac cac cac cca tgg gag        768
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245                 250                 255

cct tct gtg aga gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag        816
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260                 265                 270

gat ttt aac caa aaa ttc aca cag ctg cta ctt cta caa aga cct cac        864
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
                275                 280                 285

ccc aga agc caa gat ccc ctg gtc aag aga agc tgg cct gat tat gtg        912
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
                290                 295                 300

gag gag aat cga gga cat tta att gag atc aga gac tta ttt ggc cca        960
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305                 310                 315                 320

ggc ctg gat acc caa gaa cct cgc ata gtc ata ctg cag ggg gct gct        1008
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325                 330                 335

gga att ggg aag tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg        1056
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
                340                 345                 350

aga ggc cag ctg tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc        1104
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
                355                 360                 365

tgc aga gag ctg gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc        1152
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
                370                 375                 380

gga aaa gat ggg aca gcc act ccg gct ccc att aga cag atc ctg tct        1200
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385                 390                 395                 400

agg cca gag cgg ctg ctc ttc atc ctc gat ggt gta gat gag cca gga        1248
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405                 410                 415

tgg gtc ttg cag gag ccg agt tct gag ctc tgt ctg cac tgg agc cag        1296
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
                420                 425                 430
```

28

```
cca cag ccg gcg gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata      1344
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
        435                 440                 445

ctt ccc gag gca tcc ttc ctg atc acg gct cgg acc aca gct ctg cag      1392
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
        450                 455                 460

aac ctc att cct tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg      1440
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465                 470                 475                 480

ttc tct gag tcc agc agg aag gaa tat ttc tac aga tat ttc aca gat      1488
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                    485                 490                 495

gaa agg caa gca att aga gcc ttt agg ttg gtc aaa tca aac aaa gag      1536
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
                500                 505                 510

ctc tgg gcc ctg tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act      1584
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
        515                 520                 525

tgc ctg atg cag cag atg aag cgg aag gaa aaa ctc aca ctg act tcc      1632
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
        530                 535                 540

aag acc acc aca acc ctc tgt cta cat tac ctt gcc cag gct ctc caa      1680
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545                 550                 555                 560

gct cag cca ttg gga ccc cag ctc aga gac ctc tgc tct ctg gct gct      1728
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                565                 570                 575

gag ggc atc tgg caa aaa aag acc ctt ttc agt cca gat gac ctc agg      1776
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
                580                 585                 590

aag cat ggg tta gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt      1824
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
        595                 600                 605

att ctt caa gag cac ccc atc cct ctg agc tac agc ttc att cac ctc      1872
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
        610                 615                 620
```

29

```
tgt ttc caa gag ttc ttt gca gca atg tcc tat gtc ttg gag gat gag    1920
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625             630             635                 640

aag ggg aga ggt aaa cat tct aat tgc atc ata gat ttg gaa aag acg    1968
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                645             650             655

cta gaa gca tat gga ata cat ggc ctg ttt ggg gca tca acc aca cgt    2016
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660             665             670

ttc cta ttg ggc ctg tta agt gat gag ggg gag aga gag atg gag aac    2064
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675             680             685

atc ttt cac tgc cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc    2112
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690             695             700

ccg tcc ctg cag ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac    2160
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705             710             715             720

tgc ttg tac gag act cgg aac aaa acg ttc ctg aca caa gtg atg gcc    2208
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725             730             735

cat ttc gaa gaa atg ggc atg tgt gta gaa aca gac atg gag ctc tta    2256
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
            740             745             750

gtg tgc act ttc tgc att aaa ttc agc cgc cac gtg aag aag ctt cag    2304
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
            755             760             765

ctg att gag ggc agg cag cac aga tca aca tgg agc ccc acc atg gta    2352
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770             775             780

gtc ctg ttc agg tgg gtc cca gtc aca gat gcc tat tgg cag att ctc    2400
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785             790             795             800

ttc tcc gtc ctc aag gtc acc aga aac ctg aag gag ctg gac cta agt    2448
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805             810             815
```

30

```
gga aac tcg ctg agc cac tct gca gtg aag agt ctt tgt aag acc ctg        2496
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
            820                 825                 830

aga cgc cct cgc tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc        2544
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
            835                 840                 845

ctc aca gct gag gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac        2592
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
            850                 855                 860

cag acc ctg acc gag ctg gac ctg agc ttc aat gtg ctc acg gat gct        2640
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865                 870                 875 .                880

gga gcc aaa cac ctt tgc cag aga ctg aga cag ccg agc tgc aag cta        2688
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
            885                 890                 895

cag cga ctg cag ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag        2736
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900                 905                 910

gac ctg gcc tct gtg ctt agt gcc agc ccc agc ctg aag gag cta gac        2784
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915                 920                 925

ctg cag cag aac aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag        2832
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
            930                 935                 940

ggg ctc agg cat cct gcc tgc aaa ctc ata cgc ctg ggg aaa cca agt        2880
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945                 950                 955                 960

gtg atg acc cct act gag ggc ctg gat acg gga gag atg agt aat agc        2928
Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
                    965                 970                 975

aca tcc tca ctc aag cgg cag aga ctc gga tca gag agg gcg gct tcc        2976
Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
                    980                 985                 990

cat gtt gct cag gct aat ctc aaa ctc ctg gac gtg agc aag atc ttc        3024
His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
                995                 1000                1005
```

```
cca att gct gag att gca gag gaa agc tcc cca gag gta gta ccg gtg      3072
Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010              1015              1020

gaa ctc ttg tgc gtg cct tct cct gcc tct caa ggg gac ctg cat acg      3120
Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025              1030              1035              1040

aag cct ttg ggg act gac gat gac ttc tgg ggc ccc acg ggg cct gtg      3168
Lys Pro Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val
              1045              1050              1055

gct act gag gta gtt gac aaa gaa aag aac ttg tac cga gtt cac ttc      3216
Ala Thr Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe
          1060              1065              1070

cct gta gct ggc tcc tac cgc tgg ccc aac acg ggt ctc tgc ttt gtg      3264
Pro Val Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val
          1075              1080              1085

atg aga gaa gcg gtg acc gtt gag att gaa ttc tgt gtg tgg gac cag      3312
Met Arg Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln
    1090              1095              1100

ttc ctg ggt gag atc aac cca cag cac agc tgg atg gtg gca ggg cct      3360
Phe Leu Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro
1105              1110              1115              1120

ctg ctg gac atc aag gct gag cct gga gct gtg gaa gct gtg cac ctc      3408
Leu Leu Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu
              1125              1130              1135

cct cac ttt gtg gct ctc caa ggg ggc cat gtg gac aca tcc ctg ttc      3456
Pro His Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe
          1140              1145              1150

caa atg gcc cac ttt aaa gag gag ggg atg ctc ctg gag aag cca gcc      3504
Gln Met Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala
          1155              1160              1165

agg gtg gag ctg cat cac ata gtt ctg gaa aac ccc agc ttc tcc ccc      3552
Arg Val Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro
    1170              1175              1180

ttg gga gtc ctc ctg aaa atg atc cat aat gcc ctg cgc ttc att ccc      3600
Leu Gly Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro
1185              1190              1195              1200
```

32

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gtc acc tct gtg gtg ttg ctt tac cac cgc gtc cat cct gag gaa gtc      3648
Val Thr Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val
              1205                1210                1215


acc ttc cac ctc tac ctg atc cca agt gac tgc tcc att cgg aag gcc      3696
Thr Phe His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Ala
              1220                1225                1230


ata gat gat cta gaa atg aaa ttc cag ttt gtg cga atc cac aag cca      3744
Ile Asp Asp Leu Glu Met Lys Phe Gln Phe Val Arg Ile His Lys Pro
            1235                1240                1245


ccc ccg ctg acc cca ctt tat atg ggc tgt cgt tac act gtg tct ggg      3792
Pro Pro Leu Thr Pro Leu Tyr Met Gly Cys Arg Tyr Thr Val Ser Gly
          1250                1255                1260


tct ggt tca ggg atg ctg gaa ata ctc ccc aag gaa ctg gag ctc tgc      3840
Ser Gly Ser Gly Met Leu Glu Ile Leu Pro Lys Glu Leu Glu Leu Cys
1265                1270                1275                1280


tat cga agc cct gga gaa gac cag ctg ttc tcg gag ttc tac gtt ggc      3888
Tyr Arg Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr Val Gly
                1285                1290                1295


cac ttg gga tca ggg atc agg ctg caa gtg aaa gac aag aaa gat gag      3936
His Leu Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys Asp Glu
                1300                1305                1310


act ctg gtg tgg gag gcc ttg gtg aaa cca gga gat ctc atg cct gca      3984
Thr Leu Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met Pro Ala
            1315                1320                1325


act act ctg atc cct cca gcc cgc ata gcc gta cct tca cct ctg gat      4032
Thr Thr Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro Leu Asp
          1330                1335                1340


gcc ccg cag ttg ctg cac ttt gtg gac cag tat cga gag cag ctg ata      4080
Ala Pro Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln Leu Ile
1345                1350                1355                1360


gcc cga gtg aca tcg gtg gag gtt gtc ttg gac aaa ctg cat gga cag      4128
Ala Arg Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His Gly Gln
                1365                1370                1375


gtg ctg agc cag gag cag tac gag agg gtg ctg gct gag aac acg agg      4176
Val Leu Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn Thr Arg
              1380                1385                1390
```

33

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ccc agc cag atg cgg aag ctg ttc agc ttg agc cag tcc tgg gac cgg      4224
Pro Ser Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp Asp Arg
        1395                    1400                1405


aag tgc aaa gat gga ctc tac caa gcc ctg aag gag acc cat cct cac      4272
Lys Cys Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His Pro His
    1410                    1415                1420


ctc att atg gaa ctc tgg gag aag ggc agc aaa aag gga ctc ctg cca      4320
Leu Ile Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu Leu Pro
1425                    1430                1435                1440


ctc agc agc tga                                                      4332
Leu Ser Ser
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Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
            20                  25                  30
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
        35                  40                  45
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
    50                  55                  60
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65                  70                  75                  80
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                85                  90                  95
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100                 105                 110
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
        115                 120                 125
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
        130                 135                 140
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145                 150                 155                 160
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165                 170                 175
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180                 185                 190
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
        195                 200                 205
```

```
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
    210               215               220
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225               230               235               240
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245               250               255
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260               265               270
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
            275               280               285
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
        290               295               300
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
·305               310               315               320
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325               330               335
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
                340               345               350
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
            355               360               365
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
            370               375               380
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385               390               395               400
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405               410               415·
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
            420               425               430
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
        435               440               445
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
    450               455               460
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465               470               475               480
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485               490               495
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
            500               505               510
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
            515               520               525
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
    530               535               540
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545               550               555               560
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                565               570               575
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
            580               585               590
```

35

```
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
        595                 600                 605
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
    610                 615                 620
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625                 630                 635                 640
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                645                 650                 655
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
                660                 665                 670
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
            675                 680                 685
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
  ·  690                 ·695                 700                      ·
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                 710                 715                 720
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725                 730                 735
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740                 745                 750
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
            755                 760                 765
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
    770                 775                 780
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                 790                 795                 800
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805                 810                 815
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820                 825                 830
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
            835                 840                 845
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
    850                 855                 860
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865                 870                 875                 880
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                885                 890                 895
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900                 905                 910
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915                 920                 925
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
    930                 935                 940
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945                 950                 955                 960
Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
                965                 970                 975
```

36

```
Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
         980                 985                 990
His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
         995                1000                1005
Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010                1015                1020
Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025                1030                1035                1040
Lys Pro Leu Gly Thr Asp Asp Asp Phe Trp Gly Pro Thr Gly Pro Val
              1045                1050                1055
Ala Thr Glu Val Val Asp Lys Glu Lys Asn Leu Tyr Arg Val His Phe
         1060                1065                1070
Pro Val Ala Gly Ser Tyr Arg Trp Pro Asn Thr Gly Leu Cys Phe Val
      1075                1080                1085
Met Arg Glu Ala Val Thr Val Glu Ile Glu Phe Cys Val Trp Asp Gln
    1090                1095                1100
Phe Leu Gly Glu Ile Asn Pro Gln His Ser Trp Met Val Ala Gly Pro
1105                1110                1115                1120
Leu Leu Asp Ile Lys Ala Glu Pro Gly Ala Val Glu Ala Val His Leu
              1125                1130                1135
Pro His Phe Val Ala Leu Gln Gly Gly His Val Asp Thr Ser Leu Phe
              1140                1145                1150
Gln Met Ala His Phe Lys Glu Glu Gly Met Leu Leu Glu Lys Pro Ala
    1155                1160                1165
Arg Val Glu Leu His His Ile Val Leu Glu Asn Pro Ser Phe Ser Pro
    1170                1175                1180
Leu Gly Val Leu Leu Lys Met Ile His Asn Ala Leu Arg Phe Ile Pro
1185                1190                1195                1200
Val Thr Ser Val Val Leu Leu Tyr His Arg Val His Pro Glu Glu Val
              1205                1210                1215
Thr Phe His Leu Tyr Leu Ile Pro Ser Asp Cys Ser Ile Arg Lys Ala
         1220                1225                1230
Ile Asp Asp Leu Glu Met Lys Phe Gln Phe Val Arg Ile His Lys Pro
    1235                1240                1245
Pro Pro Leu Thr Pro Leu Tyr Met Gly Cys Arg Tyr Thr Val Ser Gly
    1250                1255                1260
Ser Gly Ser Gly Met Leu Glu Ile Leu Pro Lys Glu Leu Glu Leu Cys
1265                1270                1275                1280
Tyr Arg Ser Pro Gly Glu Asp Gln Leu Phe Ser Glu Phe Tyr Val Gly
              1285                1290                1295
His Leu Gly Ser Gly Ile Arg Leu Gln Val Lys Asp Lys Lys Asp Glu
         1300                1305                1310
Thr Leu Val Trp Glu Ala Leu Val Lys Pro Gly Asp Leu Met Pro Ala
    1315                1320                1325
Thr Thr Leu Ile Pro Pro Ala Arg Ile Ala Val Pro Ser Pro Leu Asp
    1330                1335                1340
Ala Pro Gln Leu Leu His Phe Val Asp Gln Tyr Arg Glu Gln Leu Ile
1345                1350                1355                1360
```

37

```
Ala Arg Val Thr Ser Val Glu Val Val Leu Asp Lys Leu His Gly Gln
              1365                1370                1375
Val Leu Ser Gln Glu Gln Tyr Glu Arg Val Leu Ala Glu Asn Thr Arg
          1380                1385                1390
Pro Ser Gln Met Arg Lys Leu Phe Ser Leu Ser Gln Ser Trp Asp Arg
        1395                1400                1405
Lys Cys Lys Asp Gly Leu Tyr Gln Ala Leu Lys Glu Thr His Pro His
    1410                1415                1420
Leu Ile Met Glu Leu Trp Glu Lys Gly Ser Lys Lys Gly Leu Leu Pro
1425                1430          .        1435                1440
Leu Ser Ser
```

<210> 7
<211> 1487
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(1296)

<400> 7
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atg atg aga cag agg cag agc cat tat tgt tcc gtg ctg ttc ctg agt      48
Met Met Arg Gln Arg Gln Ser His Tyr Cys Ser Val Leu Phe Leu Ser
  1               5                  10                  15

gtc aac tat ctg ggg ggg aca ttc cca gga gac att tgc tca gaa gag      96
Val Asn Tyr Leu Gly Gly Thr Phe Pro Gly Asp Ile Cys Ser Glu Glu
              20                  25                  30

aat caa ata gtt tcc tct tat gct tct aaa gtc tgt ttt gag atc gaa     144
Asn Gln Ile Val Ser Ser Tyr Ala Ser Lys Val Cys Phe Glu Ile Glu
          35                  40                  45

gaa gat tat aaa aat cgt cag ttt ctg ggg cct gaa gga aat gtg gat     192
Glu Asp Tyr Lys Asn Arg Gln Phe Leu Gly Pro Glu Gly Asn Val Asp
      50                  55                  60

gtt gag ttg att gat aag agc aca aac aga tac agc gtt tgg ttc ccc     240
Val Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe Pro
 65                  70                  75                  80

act gct ggc tgg tat ctg tgg tca gcc aca ggc ctc ggc ttc ctg gta     288
Thr Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu Val
              85                  90                  95
```

38

```
agg gat gag gtc aca gtg acg att gcg ttt ggt tcc tgg agt cag cac    336
Arg Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln His
            100                 105                 110

ctg gcc ctg gac ctg cag cac cat gaa cag tgg ctg gtg ggc ggc ccc    384
Leu Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly Pro
            115                 120                 125

ttg ttt gat gtc act gca gag cca gag gag gct gtc gcc gaa atc cac    432
Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile His
            130                 135                 140

ctc ccc cac ttc atc tcc ctc caa ggt gag gtg gac gtc tcc tgg ttt    480
Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp Phe
145                 150                 155                 160

ctc gtt gcc cat ttt aag aat gaa ggg atg gtc ctg gag cat cca gcc    528
Leu Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro Ala
                165                 170                 175

cgg gtg gag cct ttc tat gct gtc ctg gaa agc ccc agc ttc tct ctg    576
Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser Leu
            180                 185                 190

atg ggc atc ctg ctg cgg atc gcc agt ggg act cgc ctc tcc atc ccc    624
Met Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile Pro
            195                 200                 205

atc act tcc aac aca ttg atc tat tat cac ccc cac ccc gaa gat att    672
Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp Ile
            210                 215                 220

aag ttc cac ttg tac ctt gtc ccc agc gac gcc ttg cta aca aag gcg    720
Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys Ala
225                 230                 235                 240

ata gat gat gag gaa gat cgc ttc cat ggt gtg cgc ctg cag act tcg    768
Ile Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr Ser
                245                 250                 255

ccc cca atg gaa ccc ctg aac ttt ggt tcc agt tat att gtg tct aat    816
Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser Asn
            260                 265                 270

tct gct aac ctg aaa gta atg ccc aag gag ttg aaa ttg tcc tac agg    864
Ser Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr Arg
            275                 280                 285
```

```
agc cct gga gaa att cag cac ttc tca aaa ttc tat gct ggg cag atg      912
Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln Met
    290                 295                 300

aag gaa ccc att caa ctt gag att act gaa aaa aga cat ggg act ttg      960
Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr Leu
305                 310                 315                 320

gtg tgg gat act gag gtg aag cca gtg gat ctc cag ctt gta gct gca     1008
Val Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala Ala
                325                 330                 335

tca gcc cct cct cct ttc tca ggt gca gcc ttt gtg aag gag aac cac     1056
Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn His
            340                 345                 350

cgg caa ctc caa gcc agg atg ggg gac ctg aaa ggg gtg ctc gat gat     1104
Arg Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp Asp
            355                 360                 365

ctc cag gac aat gag gtt ctt act gag aat gag aag gag ctg gtg gag     1152
Leu Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val Glu
        370                 375                 380

cag gaa aag aca cgg cag agc aag aat gag gcc ttg ctg agc atg gtg     1200
Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met Val
385                 390                 395                 400

gag aag aaa ggg gac ctg gcc ctg gac gtg ctc ttc aga agc att agt     1248
Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile Ser
                405                 410                 415

gaa agg gac cct tac ctc gtg tcc tat ctt aga cag cag aat ttg taa     1296
Glu Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
            420                 425                 430


aatgagtcag ttaggtagtc tggaagagag aatccagcgt tctcattgga aatggataaa   1356

cagaaatgtg atcattgatt tcagtgttca agacagaaga agactgggta acatctatca   1416

cacaggcttt caggacagac ttgtaacctg gcatgtacct attgactgta tcctcatgca   1476

ttttcctcaa g                                                        1487


<210> 8
<211> 431
<212> PRT
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40

<213> Homo sapiens

<400> 8
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Met Met Arg Gln Arg Gln Ser His Tyr Cys Ser Val Leu Phe Leu Ser
1               5                   10                  15
Val Asn Tyr Leu Gly Gly Thr Phe Pro Gly Asp Ile Cys Ser Glu Glu
            20                  25                  30
Asn Gln Ile Val Ser Ser Tyr Ala Ser Lys Val Cys Phe Glu Ile Glu
        35                  40                  45
Glu Asp Tyr Lys Asn Arg Gln Phe Leu Gly Pro Glu Gly Asn Val Asp
        50                  55                  60
Val Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe Pro
65                  70                  75                  80
Thr Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu Val
                85                  90                  95
Arg Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln His
            100                 105                 110
Leu Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly Pro
        115                 120                 125
Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile His
        130                 135                 140
Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp Phe
145                 150                 155                 160
Leu Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro Ala
                165                 170                 175
Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser Leu
            180                 185                 190
Met Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile Pro
            195                 200                 205
Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp Ile
        210                 215                 220
Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys Ala
225                 230                 235                 240
Ile Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr Ser
                245                 250                 255
Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser Asn
            260                 265                 270
Ser Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr Arg
            275                 280                 285
Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln Met
            290                 295                 300
Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr Leu
305                 310                 315                 320
Val Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala Ala
                325                 330                 335
Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn His
            340                 345                 350
Arg Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp Asp
```

41

```
              355                    360                    365
Leu Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val Glu
        370                    375                    380
Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met Val
385                    390                    395                    400
Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile Ser
                405                    410                    415
Glu Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
                420                    425                    430


<210> 9
<211> 4556
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(4362)

<220>
<223> Description of Artificial Sequence: Synthetic
      Construct

<400> 9
atg gct ggc gga gcc tgg ggc cgc ctg gcc tgt tac ttg gag ttc ctg      48
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
  1               5                  10                  15

aag aag gag gag ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg      96
Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                20                  25                  30

cac tcc agg agc tct tcg ggt gag aca ccc gct cag cca gag aag acg     144
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
            35                  40                  45

agt ggc atg gag gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag     192
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
        50                  55                  60

cgg gcc tgg gac cta gcc ctc cat acc tgg gag cag atg ggg ctg agg     240
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65                  70                  75                  80

tca ctg tgc gcc caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc     288
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
```

42

```
ccc tac agc cca agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc    336
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
            100             105             110

tcc acc gca gtg cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc    384
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
            115             120             125

acc cag ggc tca gag aga agg gtt ttg aga cag ctg cct gac aca tct    432
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
            130             135             140

gga cgc cgc tgg aga gaa atc tct gcc tca ctc ctc tac caa gct ctt    480
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145             150             155             160

cca agc tcc cca gac cat gag tct cca agc cag gag tca ccc aac gcc    528
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165             170             175

ccc aca tcc aca gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc    576
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
            180             185             190

agc cta gca ccc aga gag cag gag gct cct ggg acc caa tgg cct ctg    624
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
            195             200             205

gat gaa acg tca gga att tac tac aca gaa atc aga gaa aga gag aga    672
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
            210             215             220

gag aaa tca gag aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg    720
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225             230             235             240

ccc cca cag gcg cac acc agc cta cag ccc cac cac cac cca tgg gag    768
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
            245             250             255

cct tct gtg aga gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag    816
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
            260             265             270

gat ttt aac caa aaa ttc aca cag ctg cta ctt cta caa aga cct cac    864
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
```

43

ccc aga agc caa gat ccc ctg gtc aag aga agc tgg cct gat tat gtg   912
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
    290   295   300

gag gag aat cga gga cat tta att gag atc aga gac tta ttt ggc cca   960
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305   310   315   320

ggc ctg gat acc caa gaa cct cgc ata gtc ata ctg cag ggg gct gct   1008
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325   330   335

gga att ggg aag tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg   1056
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
            340   345   350

aga ggc cag ctg tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc   1104
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
            355   360   365

tgc aga gag ctg gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc   1152
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
    370   375   380

gga aaa gat ggg aca gcc act ccg gct ccc att aga cag atc ctg tct   1200
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385   390   395   400

agg cca gag cgg ctg ctc ttc atc ctc gat ggt gta gat gag cca gga   1248
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405   410   415

tgg gtc ttg cag gag ccg agt tct gag ctc tgt ctg cac tgg agc cag   1296
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
                420   425   430

cca cag ccg gcg gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata   1344
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
                435   440   445

ctt ccc gag gca tcc ttc ctg atc acg gct cgg acc aca gct ctg cag   1392
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
        450   455   460

aac ctc att cct tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg   1440
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly

44

ttc tct gag tcc agc agg aag gaa tat ttc tac aga tat ttc aca gat   1488
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
              485   490   495

gaa agg caa gca att aga gcc ttt agg ttg gtc aaa tca aac aaa gag   1536
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
              500   505   510

ctc tgg gcc ctg tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act   1584
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
            515   520   525

tgc ctg atg cag cag atg aag cgg aag gaa aaa ctc aca ctg act tcc   1632
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
            530   535   540

aag acc acc aca acc ctc tgt cta cat tac ctt gcc cag gct ctc caa   1680
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545   550   555   560

gct cag cca ttg gga ccc cag ctc aga gac ctc tgc tct ctg gct gct   1728
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
              565   570   575

gag ggc atc tgg caa aaa aag acc ctt ttc agt cca gat gac ctc agg   1776
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
              580   585   590

aag cat ggg tta gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt   1824
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
            595   600   605

att ctt caa gag cac ccc atc cct ctg agc tac agc ttc att cac ctc   1872
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
            610   615   620

tgt ttc caa gag ttc ttt gca gca atg tcc tat gtc ttg gag gat gag   1920
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625   630   635   640

aag ggg aga ggt aaa cat tct aat tgc atc ata gat ttg gaa aag acg   1968
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
              645   650   655

cta gaa gca tat gga ata cat ggc ctg ttt ggg gca tca acc aca cgt   2016
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg

```
ttc cta ttg ggc ctg tta agt gat gag ggg gag aga gag atg gag aac    2064
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675                     680                     685

atc ttt cac tgc cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc    2112
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690                     695                     700

ccg tcc ctg cag ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac    2160
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705                     710                     715                 720

tgc ttg tac gag act cgg aac aaa acg ttc ctg aca caa gtg atg gcc    2208
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                725                     730                     735

cat ttc gaa gaa atg ggc atg tgt gta gaa aca gac atg gag ctc tta    2256
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740                     745                     750

gtg tgc act ttc tgc att aaa ttc agc cgc cac gtg aag aag ctt cag    2304
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
        755                     760                     765

ctg att gag ggc agg cag cac aga tca aca tgg agc ccc acc atg gta    2352
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770                     775                     780

gtc ctg ttc agg tgg gtc cca gtc aca gat gcc tat tgg cag att ctc    2400
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785                     790                     795                 800

ttc tcc gtc ctc aag gtc acc aga aac ctg aag gag ctg gac cta agt    2448
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805                     810                     815

gga aac tcg ctg agc cac tct gca gtg aag agt ctt tgt aag acc ctg    2496
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820                     825                     830

aga cgc cct cgc tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc    2544
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
            835                     840                     845

ctc aca gct gag gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac    2592
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
```

46

```
cag acc ctg acc gag ctg gac ctg agc ttc aat gtg ctc acg gat gct    2640
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865             870             875             880
```

```
gga gcc aaa cac ctt tgc cag aga ctg aga cag ccg agc tgc aag cta    2688
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
            885             890             895
```

```
cag cga ctg cag ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag    2736
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
        900             905             910
```

```
gac ctg gcc tct gtg ctt agt gcc agc ccc agc ctg aag gag cta gac    2784
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
        915             920             925
```

```
ctg cag cag aac aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag    2832
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
        930             935             940
```

```
ggg ctc agg cat cct gcc tgc aaa ctc ata cgc ctg ggg ctg gac cag    2880
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln
945             950             955             960
```

```
aca act ctg agt gat gag atg agg cag gaa ctg agg gcc ctg gag cag    2928
Thr Thr Leu Ser Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln
            965             970             975
```

```
gag aaa cct cag ctg ctc atc ttc agc aga cgg aaa cca agt gtg atg    2976
Glu Lys Pro Gln Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met
            980             985             990
```

```
acc cct act gag ggc ctg gat acg gga gag atg agt aat agc aca tcc    3024
Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser
            995             1000            1005
```

```
tca ctc aag cgg cag aga ctc gga tca gag agg gcg gct tcc cat gtt    3072
Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val
        1010            1015            1020
```

```
gct cag gct aat ctc aaa ctc ctg gac gtg agc aag atc ttc cca att    3120
Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile
1025            1030            1035            1040
```

```
gct gag att gca gag gaa agc tcc cca gag gta gta ccg gtg gaa ctc    3168
Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu
```

```
ttg tgc gtg cct tct cct gcc tct caa ggg gac ctg cat acg aag cct    3216
Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr Lys Pro
            1060                 1065                 1070

ttg ggg act gac gat gac ttt ctg ggg cct gaa gga aat gtg gat gtt    3264
Leu Gly Thr Asp Asp Asp Phe Leu Gly Pro Glu Gly Asn Val Asp Val
        1075                 1080                 1085

gag ttg att gat aag agc aca aac aga tac agc gtt tgg ttc ccc act    3312
Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe Pro Thr
       1090                 1095                 1100

gct ggc tgg tat ctg tgg tca gcc aca ggc ctc ggc ttc ctg gta agg    3360
Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu Val Arg
1105                 1110                 1115                 1120

gat gag gtc aca gtg acg att gcg ttt ggt tcc tgg agt cag cac ctg    3408
Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln His Leu
                1125                 1130                 1135

gcc ctg gac ctg cag cac cat gaa cag tgg ctg gtg ggc ggc ccc ttg    3456
Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly Pro Leu
            1140                 1145                 1150

ttt gat gtc act gca gag cca gag gag gct gtc gcc gaa atc cac ctc    3504
Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile His Leu
        1155                 1160                 1165

ccc cac ttc atc tcc ctc caa ggt gag gtg gac gtc tcc tgg ttt ctc    3552
Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp Phe Leu
    1170                 1175                 1180

gtt gcc cat ttt aag aat gaa ggg atg gtc ctg gag cat cca gcc cgg    3600
Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro Ala Arg
1185                 1190                 1195                 1200

gtg gag cct ttc tat gct gtc ctg gaa agc ccc agc ttc tct ctg atg    3648
Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser Leu Met
                1205                 1210                 1215

ggc atc ctg ctg cgg atc gcc agt ggg act cgc ctc tcc atc ccc atc    3696
Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile Pro Ile
            1220                 1225                 1230

act tcc aac aca ttg atc tat tat cac ccc cac ccc gaa gat att aag    3744
Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp Ile Lys
```

48

```
                1235                    1240                    1245

ttc cac ttg tac ctt gtc ccc agc gac gcc ttg cta aca aag gcg ata    3792
Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys Ala Ile
    1250                    1255                    1260


gat gat gag gaa gat cgc ttc cat ggt gtg cgc ctg cag act tcg ccc    3840
Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr Ser Pro
1265                    1270                    1275                    1280


cca atg gaa ccc ctg aac ttt ggt tcc agt tat att gtg tct aat tct    3888
Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser Asn Ser
                    1285                    1290                    1295


gct aac ctg aaa gta atg ccc aag gag ttg aaa ttg tcc tac agg agc    3936
Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr Arg Ser
                1300                    1305                    1310


cct gga gaa att cag cac ttc tca aaa ttc tat gct ggg cag atg aag    3984
Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln Met Lys
            1315                    1320                    1325


gaa ccc att caa ctt gag att act gaa aaa aga cat ggg act ttg gtg    4032
Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr Leu Val
    1330                    1335                    1340


tgg gat act gag gtg aag cca gtg gat ctc cag ctt gta gct gca tca    4080
Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala Ala Ser
1345                    1350                    1355                    1360


gcc cct cct cct ttc tca ggt gca gcc ttt gtg aag gag aac cac cgg    4128
Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn His Arg
                    1365                    1370                    1375


caa ctc caa gcc agg atg ggg gac ctg aaa ggg gtg ctc gat gat ctc    4176
Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp Asp Leu
                1380                    1385                    1390


cag gac aat gag gtt ctt act gag aat gag aag gag ctg gtg gag cag    4224
Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val Glu Gln
            1395                    1400                    1405


gaa aag aca cgg cag agc aag aat gag gcc ttg ctg agc atg gtg gag    4272
Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met Val Glu
    1410                    1415                    1420


aag aaa ggg gac ctg gcc ctg gac gtg ctc ttc aga agc att agt gaa    4320
Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile Ser Glu
```

```
agg gac cct tac ctc gtg tcc tat ctt aga cag cag aat ttg          4362
Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
            1445                1450


taaaatgagt cagttaggta gtctggaaga gagaatccag cgttctcatt ggaaatggat 4422

aaacagaaat gtgatcattg atttcagtgt tcaagacaga agaagactgg gtaacatcta 4482

tcacacaggc tttcaggaca gacttgtaac ctggcatgta cctattgact gtatcctcat 4542

gcattttcct caag                                                  4556
```

<210> 10
<211> 1454
<212> PRT
<213> Artificial Sequence
<223> Description of Artificial Sequence: Synthetic
      Construct

<400> 10

```
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
  1               5                  10                  15

Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
             20                  25                  30

His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
         35                  40                  45

Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
     50                  55                  60

Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65                  70                  75                  80

Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                 85                  90                  95

Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
             100                 105                 110

Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
         115                 120                 125

Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
```

50

Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145   150   155   160

Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                    165   170   175

Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
                180   185   190

Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
                195   200   205

Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
    210   215   220

Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225   230   235   240

Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245   250   255

Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260   265   270

Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
                275   280   285

Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
    290   295   300

Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305   310   315   320

Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325   330   335

Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
                340   345   350

Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
    355   360   365

Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
    370   375   380

Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser

51

Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
          405   410   415

Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
          420   425   430

Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
          435   440   445

Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
          450   455   460

Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465   470   475   480

Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
          485   490   495

Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
          500   505   510

Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
          515   520   525

Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
          530   535   540

Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545   550   555   560

Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
          565   570   575

Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
          580   585   590

Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
          595   600   605

Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
          610   615   620

Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625   630   635   640

Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr

52

Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660   665   670

Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675   680   685

Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690   695   700

Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705   710   715   720

Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
            725   730   735

His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
            740   745   750

Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
        755   760   765

Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770   775   780

Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785   790   795   800

Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
            805   810   815

Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
            820   825   830

Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
        835   840   845

Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
        850   855   860

Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865   870   875   880

Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
            885   890   895

Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln

900   905   910

Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
        915   920   925

Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
     930   935   940

Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Leu Asp Gln
945   950   955   960

Thr Thr Leu Ser Asp Glu Met Arg Gln Glu Leu Arg Ala Leu Glu Gln
                965   970   975

Glu Lys Pro Gln Leu Leu Ile Phe Ser Arg Arg Lys Pro Ser Val Met
            980   985   990

Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser Thr Ser
        995   1000   1005

Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser His Val
    1010   1015   1020

Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe Pro Ile
1025   1030   1035   1040

Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val Glu Leu
                1045   1050   1055

Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr Lys Pro
            1060   1065   1070

Leu Gly Thr Asp Asp Asp Phe Leu Gly Pro Glu Gly Asn Val Asp Val
            1075   1080   1085

Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe Pro Thr
    1090   1095   1100

Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu Val Arg
1105   1110   1115   1120

Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln His Leu
                1125   1130   1135

Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly Pro Leu
            1140   1145   1150

Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile His Leu

                                   54

Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp Phe Leu
    1170   1175   1180

Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro Ala Arg
1185   1190   1195   1200

Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser Leu Met
            1205   1210   1215

Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile Pro Ile
            1220   1225   1230

Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp Ile Lys
        1235   1240   1245

Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys Ala Ile
    1250   1255   1260

Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr Ser Pro
1265   1270   1275   1280

Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser Asn Ser
            1285   1290   1295

Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr Arg Ser
            1300   1305   1310

Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln Met Lys
        1315   1320   1325

Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr Leu Val
    1330   1335   1340

Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala Ala Ser
1345   1350   1355   1360

Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn His Arg
            1365   1370   1375

Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp Asp Leu
        1380   1385   1390

Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val Glu Gln
        1395   1400   1405

Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met Val Glu

```
                1410                    1415                    1420

Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile Ser Glu
1425                    1430                    1435                    1440

Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
                       1445                    1450




<210> 11
<211> 4466
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(4272)

<220>
<223> Description of Artificial Sequence: Synthetic
      Construct

<400> 11
atg gct ggc gga gcc tgg ggc cgc ctg gcc tgt tac ttg gag ttc ctg      48
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
  1               5                  10                  15

aag aag gag gag ctg aag gag ttc cag ctt ctg ctc gcc aat aaa gcg      96
Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                 20                  25                  30

cac tcc agg agc tct tcg ggt gag aca ccc gct cag cca gag aag acg     144
His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
             35                  40                  45

agt ggc atg gag gtg gcc tcg tac ctg gtg gct cag tat ggg gag cag     192
Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
         50                  55                  60

cgg gcc tgg gac cta gcc ctc cat acc tgg gag cag atg ggg ctg agg     240
Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65                  70                  75                  80

tca ctg tgc gcc caa gcc cag gaa ggg gca ggc cac tct ccc tca ttc     288
Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                 85                  90                  95
```

56

```
ccc tac agc cca agt gaa ccc cac ctg ggg tct ccc agc caa ccc acc      336
Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
                100             105             110

tcc acc gca gtg cta atg ccc tgg atc cat gaa ttg ccg gcg ggg tgc      384
Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
                115             120             125

acc cag ggc tca gag aga agg gtt ttg aga cag ctg cct gac aca tct      432
Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
                130             135             140

gga cgc cgc tgg aga gaa atc tct gcc tca ctc ctc tac caa gct ctt      480
Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145             150             155             160

cca agc tcc cca gac cat gag tct cca agc cag gag tca ccc aac gcc      528
Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                165             170             175

ccc aca tcc aca gca gtg ctg ggg agc tgg gga tcc cca cct cag ccc      576
Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
                180             185             190

agc cta gca ccc aga gag cag gag gct cct ggg acc caa tgg cct ctg      624
Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
            195             200             205

gat gaa acg tca gga att tac tac aca gaa atc aga gaa aga gag aga      672
Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
        210             215             220

gag aaa tca gag aaa ggc agg ccc cca tgg gca gcg gtg gta gga acg      720
Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225             230             235             240

ccc cca cag gcg cac acc agc cta cag ccc cac cac cac cca tgg gag      768
Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
                245             250             255

cct tct gtg aga gag agc ctc tgt tcc aca tgg ccc tgg aaa aat gag      816
Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
                260             265             270

gat ttt aac caa aaa ttc aca cag ctg cta ctt cta caa aga cct cac      864
Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
                275             280             285
```

57

```
ccc aga agc caa gat ccc ctg gtc aag aga agc tgg cct gat tat gtg        912
Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
    290             295                 300

gag gag aat cga gga cat tta att gag atc aga gac tta ttt ggc cca        960
Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305             310                 315                 320

ggc ctg gat acc caa gaa cct cgc ata gtc ata ctg cag ggg gct gct       1008
Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
                325                 330                 335

gga att ggg aag tca aca ctg gcc agg cag gtg aag gaa gcc tgg ggg       1056
Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
            340                 345                 350

aga ggc cag ctg tat ggg gac cgc ttc cag cat gtc ttc tac ttc agc       1104
Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
            355                 360                 365

tgc aga gag ctg gcc cag tcc aag gtg gtg agt ctc gct gag ctc atc       1152
Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
    370                 375                 380

gga aaa gat ggg aca gcc act ccg gct ccc att aga cag atc ctg tct       1200
Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385                 390                 395                 400

agg cca gag cgg ctg ctc ttc atc ctc gat ggt gta gat gag cca gga       1248
Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405                 410                 415

tgg gtc ttg cag gag ccg agt tct gag ctc tgt ctg cac tgg agc cag       1296
Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
            420                 425                 430

cca cag ccg gcg gat gca ctg ctg ggc agt ttg ctg ggg aaa act ata       1344
Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
            435                 440                 445

ctt ccc gag gca tcc ttc ctg atc acg gct cgg acc aca gct ctg cag       1392
Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
    450                 455                 460

aac ctc att cct tct ttg gag cag gca cgt tgg gta gag gtc ctg ggg       1440
Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465                 470                 475                 480
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58

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ttc tct gag tcc agc agg aag gaa tat ttc tac aga tat ttc aca gat       1488
Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485                 490                 495

gaa agg caa gca att aga gcc ttt agg ttg gtc aaa tca aac aaa gag       1536
Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
                500                 505                 510

ctc tgg gcc ctg tgt ctt gtg ccc tgg gtg tcc tgg ctg gcc tgc act       1584
Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
                515                 520                 525

tgc ctg atg cag cag atg aag cgg aag gaa aaa ctc aca ctg act tcc       1632
Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
                530                 535                 540

aag acc acc aca acc ctc tgt cta cat tac ctt gcc cag gct ctc caa       1680
Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545                 550                 555                 560

gct cag cca ttg gga ccc cag ctc aga gac ctc tgc tct ctg gct gct       1728
Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
                565                 570                 575

gag ggc atc tgg caa aaa aag acc ctt ttc agt cca gat gac ctc agg       1776
Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
                580                 585                 590

aag cat ggg tta gat ggg gcc atc atc tcc acc ttc ttg aag atg ggt       1824
Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
                595                 600                 605

att ctt caa gag cac ccc atc cct ctg agc tac agc ttc att cac ctc       1872
Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
                610                 615                 620

tgt ttc caa gag ttc ttt gca gca atg tcc tat gtc ttg gag gat gag       1920
Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625                 630                 635                 640

aag ggg aga ggt aaa cat tct aat tgc atc ata gat ttg gaa aag acg       1968
Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
                645                 650                 655

cta gaa gca tat gga ata cat ggc ctg ttt ggg gca tca acc aca cgt       2016
Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
                660                 665                 670
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ttc cta ttg ggc ctg tta agt gat gag ggg gag aga gag atg gag aac      2064
Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
        675               680               685

atc ttt cac tgc cgg ctg tct cag ggg agg aac ctg atg cag tgg gtc      2112
Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
        690               695               700

ccg tcc ctg cag ctg ctg ctg cag cca cac tct ctg gag tcc ctc cac      2160
Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705               710               715               720

tgc ttg tac gag act cgg aac aaa acg ttc ctg aca caa gtg atg gcc      2208
Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
                    725               730               735

cat ttc gaa gaa atg ggc atg tgt gta gaa aca gac atg gag ctc tta      2256
His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
                740               745               750

gtg tgc act ttc tgc att aaa ttc agc cgc cac gtg aag aag ctt cag      2304
Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
        755               760               765

ctg att gag ggc agg cag cac aga tca aca tgg agc ccc acc atg gta      2352
Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
        770               775               780

gtc ctg ttc agg tgg gtc cca gtc aca gat gcc tat tgg cag att ctc      2400
Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785               790               795               800

ttc tcc gtc ctc aag gtc acc aga aac ctg aag gag ctg gac cta agt      2448
Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
                805               810               815

gga aac tcg ctg agc cac tct gca gtg aag agt ctt tgt aag acc ctg      2496
Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
                820               825               830

aga cgc cct cgc tgc ctc ctg gag acc ctg cgg ttg gct ggc tgt ggc      2544
Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
            835               840               845

ctc aca gct gag gac tgc aag gac ctt gcc ttt ggg ctg aga gcc aac      2592
Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
        850               855               860
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60

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cag acc ctg acc gag ctg gac ctg agc ttc aat gtg ctc acg gat gct      2640
Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865                     870             875             880

gga gcc aaa cac ctt tgc cag aga ctg aga cag ccg agc tgc aag cta      2688
Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
                885             890             895

cag cga ctg cag ctg gtc agc tgt ggc ctc acg tct gac tgc tgc cag      2736
Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900             905             910

gac ctg gcc tct gtg ctt agt gcc agc ccc agc ctg aag gag cta gac      2784
Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915             920             925

ctg cag cag aac aac ctg gat gac gtt ggc gtg cga ctg ctc tgt gag      2832
Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
            930             935             940

ggg ctc agg cat cct gcc tgc aaa ctc ata cgc ctg ggg aaa cca agt      2880
Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945             950             955             960

gtg atg acc cct act gag ggc ctg gat acg gga gag atg agt aat agc      2928
Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
                965             970             975

aca tcc tca ctc aag cgg cag aga ctc gga tca gag agg gcg gct tcc      2976
Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
                980             985             990

cat gtt gct cag gct aat ctc aaa ctc ctg gac gtg agc aag atc ttc      3024
His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
            995             1000            1005

cca att gct gag att gca gag gaa agc tcc cca gag gta gta ccg gtg      3072
Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010            1015            1020

gaa ctc ttg tgc gtg cct tct cct gcc tct caa ggg gac ctg cat acg      3120
Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025            1030            1035            1040

aag cct ttg ggg act gac gat gac ttt ctg ggg cct gaa gga aat gtg      3168
Lys Pro Leu Gly Thr Asp Asp Asp Phe Leu Gly Pro Glu Gly Asn Val
            1045            1050            1055
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gat gtt gag ttg att gat aag agc aca aac aga tac agc gtt tgg ttc        3216
Asp Val Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe
         1060              1065              1070

ccc act gct ggc tgg tat ctg tgg tca gcc aca ggc ctc ggc ttc ctg        3264
Pro Thr Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu
         1075              1080              1085

gta agg gat gag gtc aca gtg acg att gcg ttt ggt tcc tgg agt cag        3312
Val Arg Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln
         1090              1095              1100

cac ctg gcc ctg gac ctg cag cac cat gaa cag tgg ctg gtg ggc ggc        3360
His Leu Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly
1105              1110              1115              1120

ccc ttg ttt gat gtc act gca gag cca gag gag gct gtc gcc gaa atc        3408
Pro Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile
              1125              1130              1135

cac ctc ccc cac ttc atc tcc ctc caa ggt gag gtg gac gtc tcc tgg        3456
His Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp
              1140              1145              1150

ttt ctc gtt gcc cat ttt aag aat gaa ggg atg gtc ctg gag cat cca        3504
Phe Leu Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro
              1155              1160              1165

gcc cgg gtg gag cct ttc tat gct gtc ctg gaa agc ccc agc ttc tct        3552
Ala Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser
         1170              1175              1180

ctg atg ggc atc ctg ctg cgg atc gcc agt ggg act cgc ctc tcc atc        3600
Leu Met Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile
1185              1190              1195              1200

ccc atc act tcc aac aca ttg atc tat tat cac ccc cac ccc gaa gat        3648
Pro Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp
              1205              1210              1215

att aag ttc cac ttg tac ctt gtc ccc agc gac gcc ttg cta aca aag        3696
Ile Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys
         1220              1225              1230

gcg ata gat gat gag gaa gat cgc ttc cat ggt gtg cgc ctg cag act        3744
Ala Ile Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr
         1235              1240              1245
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tcg ccc cca atg gaa ccc ctg aac ttt ggt tcc agt tat att gtg tct   3792
Ser Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser
    1250   1255   1260

aat tct gct aac ctg aaa gta atg ccc aag gag ttg aaa ttg tcc tac   3840
Asn Ser Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr
1265   1270   1275   1280

agg agc cct gga gaa att cag cac ttc tca aaa ttc tat gct ggg cag   3888
Arg Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln
              1285   1290   1295

atg aag gaa ccc att caa ctt gag att act gaa aaa aga cat ggg act   3936
Met Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr
              1300   1305   1310

ttg gtg tgg gat act gag gtg aag cca gtg gat ctc cag ctt gta gct   3984
Leu Val Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala
              1315   1320   1325

gca tca gcc cct cct cct ttc tca ggt gca gcc ttt gtg aag gag aac   4032
Ala Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn
    1330   1335   1340

cac cgg caa ctc caa gcc agg atg ggg gac ctg aaa ggg gtg ctc gat   4080
His Arg Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp
1345   1350   1355   1360

gat ctc cag gac aat gag gtt ctt act gag aat gag aag gag ctg gtg   4128
Asp Leu Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val
              1365   1370   1375

gag cag gaa aag aca cgg cag agc aag aat gag gcc ttg ctg agc atg   4176
Glu Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met
              1380   1385   1390

gtg gag aag aaa ggg gac ctg gcc ctg gac gtg ctc ttc aga agc att   4224
Val Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile
    1395   1400   1405

agt gaa agg gac cct tac ctc gtg tcc tat ctt aga cag cag aat ttg   4272
Ser Glu Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
    1410   1415   1420

taaaatgagt cagttaggta gtctggaaga gagaatccag cgttctcatt ggaaatggat 4332

aaacagaaat gtgatcattg atttcagtgt tcaagacaga agaagactgg gtaacatcta 4392

63

tcacacaggc tttcaggaca gacttgtaac ctggcatgta cctattgact gtatcctcat 4452

gcattttcct caag   4466

<210> 12
<211> 1424
<212> PRT
<213> Artificial Sequence
<223> Description of Artificial Sequence: Synthetic
      Construct

<400> 12
Met Ala Gly Gly Ala Trp Gly Arg Leu Ala Cys Tyr Leu Glu Phe Leu
  1   5   10   15

Lys Lys Glu Glu Leu Lys Glu Phe Gln Leu Leu Leu Ala Asn Lys Ala
                 20   25   30

His Ser Arg Ser Ser Ser Gly Glu Thr Pro Ala Gln Pro Glu Lys Thr
             35   40   45

Ser Gly Met Glu Val Ala Ser Tyr Leu Val Ala Gln Tyr Gly Glu Gln
         50   55   60

Arg Ala Trp Asp Leu Ala Leu His Thr Trp Glu Gln Met Gly Leu Arg
 65   70   75   80

Ser Leu Cys Ala Gln Ala Gln Glu Gly Ala Gly His Ser Pro Ser Phe
                 85   90   95

Pro Tyr Ser Pro Ser Glu Pro His Leu Gly Ser Pro Ser Gln Pro Thr
             100   105   110

Ser Thr Ala Val Leu Met Pro Trp Ile His Glu Leu Pro Ala Gly Cys
         115   120   125

Thr Gln Gly Ser Glu Arg Arg Val Leu Arg Gln Leu Pro Asp Thr Ser
     130   135   140

Gly Arg Arg Trp Arg Glu Ile Ser Ala Ser Leu Leu Tyr Gln Ala Leu
145   150   155   160

Pro Ser Ser Pro Asp His Glu Ser Pro Ser Gln Glu Ser Pro Asn Ala
                 165   170   175

Pro Thr Ser Thr Ala Val Leu Gly Ser Trp Gly Ser Pro Pro Gln Pro
             180   185   190

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Ser Leu Ala Pro Arg Glu Gln Glu Ala Pro Gly Thr Gln Trp Pro Leu
        195   200   205

Asp Glu Thr Ser Gly Ile Tyr Tyr Thr Glu Ile Arg Glu Arg Glu Arg
        210   215   220

Glu Lys Ser Glu Lys Gly Arg Pro Pro Trp Ala Ala Val Val Gly Thr
225   230   235   240

Pro Pro Gln Ala His Thr Ser Leu Gln Pro His His His Pro Trp Glu
        245   250   255

Pro Ser Val Arg Glu Ser Leu Cys Ser Thr Trp Pro Trp Lys Asn Glu
        260   265   270

Asp Phe Asn Gln Lys Phe Thr Gln Leu Leu Leu Leu Gln Arg Pro His
        275   280   285

Pro Arg Ser Gln Asp Pro Leu Val Lys Arg Ser Trp Pro Asp Tyr Val
        290   295   300

Glu Glu Asn Arg Gly His Leu Ile Glu Ile Arg Asp Leu Phe Gly Pro
305   310   315   320

Gly Leu Asp Thr Gln Glu Pro Arg Ile Val Ile Leu Gln Gly Ala Ala
        325   330   335

Gly Ile Gly Lys Ser Thr Leu Ala Arg Gln Val Lys Glu Ala Trp Gly
        340   345   350

Arg Gly Gln Leu Tyr Gly Asp Arg Phe Gln His Val Phe Tyr Phe Ser
        355   360   365

Cys Arg Glu Leu Ala Gln Ser Lys Val Val Ser Leu Ala Glu Leu Ile
        370   375   380

Gly Lys Asp Gly Thr Ala Thr Pro Ala Pro Ile Arg Gln Ile Leu Ser
385   390   395   400

Arg Pro Glu Arg Leu Leu Phe Ile Leu Asp Gly Val Asp Glu Pro Gly
                405   410   415

Trp Val Leu Gln Glu Pro Ser Ser Glu Leu Cys Leu His Trp Ser Gln
        420   425   430

Pro Gln Pro Ala Asp Ala Leu Leu Gly Ser Leu Leu Gly Lys Thr Ile
        435   440   445

65

Leu Pro Glu Ala Ser Phe Leu Ile Thr Ala Arg Thr Thr Ala Leu Gln
    450   455   460

Asn Leu Ile Pro Ser Leu Glu Gln Ala Arg Trp Val Glu Val Leu Gly
465   470   475   480

Phe Ser Glu Ser Ser Arg Lys Glu Tyr Phe Tyr Arg Tyr Phe Thr Asp
                485   490   495

Glu Arg Gln Ala Ile Arg Ala Phe Arg Leu Val Lys Ser Asn Lys Glu
            500   505   510

Leu Trp Ala Leu Cys Leu Val Pro Trp Val Ser Trp Leu Ala Cys Thr
            515   520   525

Cys Leu Met Gln Gln Met Lys Arg Lys Glu Lys Leu Thr Leu Thr Ser
    530   535   540

Lys Thr Thr Thr Thr Leu Cys Leu His Tyr Leu Ala Gln Ala Leu Gln
545   550   555   560

Ala Gln Pro Leu Gly Pro Gln Leu Arg Asp Leu Cys Ser Leu Ala Ala
            565   570   575

Glu Gly Ile Trp Gln Lys Lys Thr Leu Phe Ser Pro Asp Asp Leu Arg
            580   585   590

Lys His Gly Leu Asp Gly Ala Ile Ile Ser Thr Phe Leu Lys Met Gly
            595   600   605

Ile Leu Gln Glu His Pro Ile Pro Leu Ser Tyr Ser Phe Ile His Leu
    610   615   620

Cys Phe Gln Glu Phe Phe Ala Ala Met Ser Tyr Val Leu Glu Asp Glu
625   630   635   640

Lys Gly Arg Gly Lys His Ser Asn Cys Ile Ile Asp Leu Glu Lys Thr
            645   650   655

Leu Glu Ala Tyr Gly Ile His Gly Leu Phe Gly Ala Ser Thr Thr Arg
            660   665   670

Phe Leu Leu Gly Leu Leu Ser Asp Glu Gly Glu Arg Glu Met Glu Asn
            675   680   685

Ile Phe His Cys Arg Leu Ser Gln Gly Arg Asn Leu Met Gln Trp Val
    690   695   700

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Pro Ser Leu Gln Leu Leu Leu Gln Pro His Ser Leu Glu Ser Leu His
705             710             715                 720

Cys Leu Tyr Glu Thr Arg Asn Lys Thr Phe Leu Thr Gln Val Met Ala
            725             730             735

His Phe Glu Glu Met Gly Met Cys Val Glu Thr Asp Met Glu Leu Leu
            740             745             750

Val Cys Thr Phe Cys Ile Lys Phe Ser Arg His Val Lys Lys Leu Gln
755             760             765

Leu Ile Glu Gly Arg Gln His Arg Ser Thr Trp Ser Pro Thr Met Val
    770             775             780

Val Leu Phe Arg Trp Val Pro Val Thr Asp Ala Tyr Trp Gln Ile Leu
785             790             795                 800

Phe Ser Val Leu Lys Val Thr Arg Asn Leu Lys Glu Leu Asp Leu Ser
            805             810             815

Gly Asn Ser Leu Ser His Ser Ala Val Lys Ser Leu Cys Lys Thr Leu
            820             825             830

Arg Arg Pro Arg Cys Leu Leu Glu Thr Leu Arg Leu Ala Gly Cys Gly
    835             840             845

Leu Thr Ala Glu Asp Cys Lys Asp Leu Ala Phe Gly Leu Arg Ala Asn
    850             855             860

Gln Thr Leu Thr Glu Leu Asp Leu Ser Phe Asn Val Leu Thr Asp Ala
865             870             875                 880

Gly Ala Lys His Leu Cys Gln Arg Leu Arg Gln Pro Ser Cys Lys Leu
            885             890             895

Gln Arg Leu Gln Leu Val Ser Cys Gly Leu Thr Ser Asp Cys Cys Gln
            900             905             910

Asp Leu Ala Ser Val Leu Ser Ala Ser Pro Ser Leu Lys Glu Leu Asp
            915             920             925

Leu Gln Gln Asn Asn Leu Asp Asp Val Gly Val Arg Leu Leu Cys Glu
    930             935             940

Gly Leu Arg His Pro Ala Cys Lys Leu Ile Arg Leu Gly Lys Pro Ser
945             950             955                 960
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Val Met Thr Pro Thr Glu Gly Leu Asp Thr Gly Glu Met Ser Asn Ser
           965   970   975

Thr Ser Ser Leu Lys Arg Gln Arg Leu Gly Ser Glu Arg Ala Ala Ser
           980   985   990

His Val Ala Gln Ala Asn Leu Lys Leu Leu Asp Val Ser Lys Ile Phe
      995   1000   1005

Pro Ile Ala Glu Ile Ala Glu Glu Ser Ser Pro Glu Val Val Pro Val
    1010   1015   1020

Glu Leu Leu Cys Val Pro Ser Pro Ala Ser Gln Gly Asp Leu His Thr
1025   1030   1035   1040

Lys Pro Leu Gly Thr Asp Asp Asp Phe Leu Gly Pro Glu Gly Asn Val
           1045   1050   1055

Asp Val Glu Leu Ile Asp Lys Ser Thr Asn Arg Tyr Ser Val Trp Phe
           1060   1065   1070

Pro Thr Ala Gly Trp Tyr Leu Trp Ser Ala Thr Gly Leu Gly Phe Leu
       1075   1080   1085

Val Arg Asp Glu Val Thr Val Thr Ile Ala Phe Gly Ser Trp Ser Gln
    1090   1095   1100

His Leu Ala Leu Asp Leu Gln His His Glu Gln Trp Leu Val Gly Gly
1105   1110   1115   1120

Pro Leu Phe Asp Val Thr Ala Glu Pro Glu Glu Ala Val Ala Glu Ile
           1125   1130   1135

His Leu Pro His Phe Ile Ser Leu Gln Gly Glu Val Asp Val Ser Trp
          1140   1145   1150

Phe Leu Val Ala His Phe Lys Asn Glu Gly Met Val Leu Glu His Pro
       1155   1160   1165

Ala Arg Val Glu Pro Phe Tyr Ala Val Leu Glu Ser Pro Ser Phe Ser
       1170   1175   1180

Leu Met Gly Ile Leu Leu Arg Ile Ala Ser Gly Thr Arg Leu Ser Ile
1185   1190   1195   1200

Pro Ile Thr Ser Asn Thr Leu Ile Tyr Tyr His Pro His Pro Glu Asp
          1205   1210   1215

Ile Lys Phe His Leu Tyr Leu Val Pro Ser Asp Ala Leu Leu Thr Lys
        1220   1225   1230

Ala Ile Asp Asp Glu Glu Asp Arg Phe His Gly Val Arg Leu Gln Thr
        1235   1240   1245

Ser Pro Pro Met Glu Pro Leu Asn Phe Gly Ser Ser Tyr Ile Val Ser
        1250   1255   1260

Asn Ser Ala Asn Leu Lys Val Met Pro Lys Glu Leu Lys Leu Ser Tyr
1265   1270   1275   1280

Arg Ser Pro Gly Glu Ile Gln His Phe Ser Lys Phe Tyr Ala Gly Gln
                1285   1290   1295

Met Lys Glu Pro Ile Gln Leu Glu Ile Thr Glu Lys Arg His Gly Thr
        1300   1305   1310

Leu Val Trp Asp Thr Glu Val Lys Pro Val Asp Leu Gln Leu Val Ala
        1315   1320   1325

Ala Ser Ala Pro Pro Pro Phe Ser Gly Ala Ala Phe Val Lys Glu Asn
        1330   1335   1340

His Arg Gln Leu Gln Ala Arg Met Gly Asp Leu Lys Gly Val Leu Asp
1345   1350   1355   1360

Asp Leu Gln Asp Asn Glu Val Leu Thr Glu Asn Glu Lys Glu Leu Val
                1365   1370   1375

Glu Gln Glu Lys Thr Arg Gln Ser Lys Asn Glu Ala Leu Leu Ser Met
                1380   1385   1390

Val Glu Lys Lys Gly Asp Leu Ala Leu Asp Val Leu Phe Arg Ser Ile
        1395   1400   1405

Ser Glu Arg Asp Pro Tyr Leu Val Ser Tyr Leu Arg Gln Gln Asn Leu
        1410   1415   1420

<210> 13
<211> 32
<212> DNA
<213> Artificial Sequence

<220>

<400> 13
ccgaattcac catggctggc ggagcctggg gc   32

<210> 14
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 14
ccgctcgagt caacagaggg ttgtggtggt cttg   34

<210> 15
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 15
cccgaattcg aacctcgcat agtcatactg c   31

<210> 16
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 16
gtcccacaac agaattcaat ctcaacggtc   30

<210> 17
<211> 21
<212> DNA
<213> Homo sapiens

<400> 17

tgtgatgaga gaagcggtga c   21

<210> 18
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 18
ccgctcgagc aaagaagggt cagccaaagc   30